

BOOK REVIEW

**Distribution atlas of butterflies in Europe by O. Kudrna, A. Harpke, K. Lux, J. Pennerstorfer, O. Schweiger, J. Settele and M. Wiemers, 2011**

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Butterflies are arguably the best known insects in the world with regard to their taxonomy and distribution. If anywhere on Earth, this applies to Europe with over 250 years history of butterfly research since Linnean times. One might therefore ask what niche a novel distribution atlas for European butterflies might fill on the book market. This question seems even more suggestive given that the senior author of this present volume, Otakar Kudrna, published a first such atlas less than 10 years ago (Kudrna, 2002). The clear answer to such skeptical conjecture is: YES, this new atlas IS a valuable addition to the butterfly literature. The book is based on an international mapping campaign spanning almost all European countries. Only Belarus and the European fraction of Russia are not covered. This project was solely coordinated, in an enormous personal effort and essentially without any support from external or institutional funds, by Kudrna over some 25 years. The earlier atlas published in 2002 was the first significant outcome of this enterprise and attracted somewhat controversial commentaries in the lepidopterological community (see C. M. Naumann, 2002, *Entomologische Zeitschrift* 112: 340; vs. Z. Kolev, 2003, *Nota lepidopterologica* 25: 280–283). This new version is based on a very much advanced data set and, with the assistance of a number of co-authors most shortcomings of the first atlas have been overcome.

The book starts with a short preface to set the stage of the whole “Mapping European Butterflies” adventure. Then, in a general part Kudrna introduces the sources of data and the data-basing system behind. This system is a slightly critical issue since records

were electronically stored with the help of 9145 pre-selected “reference localities” (RL) instead of precise geographic coordinates. Each ‘true’ locality of a butterfly record was substituted by its nearest RL. This procedure by necessity introduced some fuzziness in the data when later being represented on maps. This was one of the major critical points raised by Kolev (*loc. cit.*), but on a large pan-European scale this slight imprecision appears negligible. For scientists with regional or national interests, however, this procedure decreases the value of the mapping program because on such smaller spatial scales the extent of transmission errors may be unacceptably large. As an example, there are records of various alpine butterflies indicated on the maps to occur in lowland areas of easternmost or northern Austria (*Pyrgus cacaliae*, *Colias phicomone*, *Euphydryas cynthia*, *Boloria pales*, *Plebejus orbitulus*) – which in all likelihood are just distorted representations of data points due to the use of the RL system.

The subsequent chapter outlines the systematic and taxonomic arrangement of butterfly species used in the atlas. Kudrna’s version of European butterfly systematics will not go without critiques. For example the decision whether a certain group of species deserves genus rank or not is still a matter of debate (and sometimes taste), even in the era of molecular systematics. The same applies to the recognition of local forms as valid species, or just as genotypes within species boundaries. On the genus level, Kudrna accepts, in a rather coherent manner, an inclusive approach, i.e. he (laudably) disregards many of the atomized ‘genera’ that have been popular in European butterfly books after about 1950. On the species level, his solution is less coherent: some allopatric island or mountain forms of debatable taxonomic rank are treated as distinct ‘good’ species (like *Plebejus aquilo*, *pyrenaicus*, *dardanus*, and *zulichii* as species distinct from *P. glandon*), whereas in other cases such forms are lumped into one (e.g. the taxa around *Polyommatus eros* and *P. eroides*). But these are minor issues relative to the major thrust of the atlas, which is the presentation of distribution maps. They form the main part of the book (pp. 45–483), printed

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in color and arranged in alphabetical order. Color codes allow to distinguish records from three temporal horizons (pre-1950; 1950-1980; and post-1980). These maps give an unprecedented and comprehensive overview of the butterflies' European distributions, even though such maps will never be 'complete'. The authors themselves emphasize and honestly admit some sources of incompleteness (e.g. insurmountable problems with data migration between different storage systems, or the validation of literature records). Kudrna and his co-workers also strictly adhered to the concept "if in doubt, leave it out", which resulted in the deliberate omission of records that were not substantiated well enough to be adopted.

By browsing through the maps some few obvious omissions struck me. *Zerynthia polyxena* had historically been recorded in SE Germany (Bavaria, near river Danube), but is missing for the whole country on the map – whereas other nationally extinct species are covered (*Polyommatus semiargus* and *Lycaena dispar* in Great Britain). *Polyommatus amandus* has no records from all over Romania, and *Maculinea (Phengaris) nausithous* does not appear for Bulgaria, though records do exist in both cases. A comparison with a rather recent and well documented butterfly atlas from the Czech Republic (Benes *et al.*, 2003) revealed that for quite a number of endangered butterfly species (e.g. *Parnassius apollo*, *Neptis sappho*, *Lycaena helle*) critically revised and confirmed historical records cover far larger fractions of that country than indicated on the new maps. Hence, for species of international conservation concern the situation indeed may look duller than one might extract from the new European atlas. Some other errors relate, for example, to *Aricia agestis* (mapped to occur in southern Norway, but the species is not mentioned to be part of the Norwegian fauna: Aarvik *et al.*, 2009) or to *Scolitantides baton* (mapped to occur all over the Iberian peninsula, but it only occurs in the northernmost parts of Spain: García-Barros *et al.*, 2004). Overall, however, such errors are minor relative to the huge amount of information that can be extracted from this new volume, be it for subsequent use in ecology, biogeography, or conservation.

The book concludes with a synthesis chapter that touches upon diverse aspects such as status of recording, biogeographical and macro-ecological patterns, and conservation issues. A references list, a gazetteer of the reference localities used for

data storage and management, a glossary of terms and abbreviations, and a taxonomic index are appended.

This new butterfly atlas will be an indispensable resource of distributional information for any researcher with a detailed and deep interest into the European butterfly fauna. It will come as surprise for many readers how many European butterfly species have strikingly narrow distributional ranges. For many more general readers, however, another book from largely the same team of authors (Settele *et al.*, 2008, available as Open Access publication for free download) will possibly remain more interesting, since this latter volume also contains ecological and photographic portraits of all species besides distribution maps (though based on less actual and fewer data) and modeled maps of expected ranges under different climate change scenarios. Yet, in contrast to the new atlas by Kudrna and co-workers this earlier volume gives distribution maps only for the more widely distributed species. Overall, this new atlas will remain as an important reference source for many years to come – a must for university and museum libraries, and a highly recommended work for biogeographers and conservationists alike.

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